



FIRE CREW FIREFIGHTER TRAINING

Procedures Handbook 4200

TOOLS AND EQUIPMENT

TOPIC: CUTTING TOOLS

TIME FRAME: 1:00

LEVEL OF INSTRUCTION: Level II

BEHAVIORAL OBJECTIVE:

Condition: Given a written or oral quiz

Behavior: The student will confirm a knowledge of the use, proper care and maintenance, and safe handling of cutting tools for firefighting

Standard: With a minimum 70% accuracy

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audio visual equipment and screen
- Cutting tools with guards
- Gloves and file with guard
- Video: "Hand Tools for Wildfire" (15 min.)
- Video: "Cutting Tools for Firefighters" (12 min.)
- Slides/transparencies for this lesson
- Student Information Sheet 4205.3-1
- Topic Quiz

REFERENCES: • CDF Fire Protection Training Handbook 4300

PREPARATION: Cutting tools are used primarily for cutting brush and small trees. Your job as a Fire Crew Firefighter requires you to know how to use and maintain the hand tools. A correctly sharpened and maintained tool is essential for safety and efficiency.



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CUTTING TOOLS

PRESENTATION

APPLICATION

I. INTRODUCTION

Show Videos:
"Hand Tools for
Wildfire" (15 min.)

"Cutting Tools for
Firefighters" (12 min.)

II. BRUSH HOOK:

NOTE: Demonstrate with each tool in turn

A. Nomenclature:

NOTE: Hand out Student Information Sheet 4205.3-1, and refer students to page 1 (Page numbers hereafter will refer to this Student Information Sheet)

Display graphic
4205.3-1, page 1

1. Head
2. Cutting edge
 - a) Point or toe
 - b) Heel
3. Strap
4. Eye
 - a) Wooden wedge
 - b) Metal wedges
 - c) Plastic wedge
5. Rivet (safety pin)
6. Handle



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B. Use

1. Cut tree limbs and brush from 1 to 3 inches in diameter
2. Grip

NOTE: Demonstrate

- a) Firm enough to prevent slippage
 - b) Weak hand on end of handle
 - c) Hands should come together during swing, with strong hand sliding toward weak hand
 - d) Slide strong hand down handle to retrieve tool after swing.
3. Stance
 - a) Firm, well balanced footing
 - b) Feet apart with weak side foot slightly forward to maintain balance through entire motion
 4. Swing
 - a) Check for obstructions in tool path
 - b) Swing tool in a direction that will not endanger others
 - 1) Handle could break
 - 2) Head could come loose
 - 3) Handle could slip out of your hands
 - c) Check what tool will hit if target is missed or severed, or if tool glances off



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<ul style="list-style-type: none">1) Especially your feet or rocksd) Keep eye on targete) Downward, angling motion is usually most effective for upright fuel <p>5. Cut stems and limbs at a 45 to 60 degree angle</p> <ul style="list-style-type: none">a) Slices through grain of wood <p>C. Sharpening</p> <p>NOTE: Refer students to page 2</p> <ul style="list-style-type: none">1. Do not sharpen point2. Taper should be 3/4 inch on the throat3. Taper should be 1 inch on the straight portion <p>III. PULASKI:</p> <p>A. Nomenclature</p> <p>NOTE: Refer students to page 3</p> <ul style="list-style-type: none">1. Head2. Cutting edge3. Grubbing edge4. Eye<ul style="list-style-type: none">a) Wooden wedge	<p>Display graphic 4205.3-1, page 2</p> <p>Display graphic 4205.3-1, page 3</p>



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PRESENTATION	APPLICATION
<ul style="list-style-type: none">b) Metal wedge5. Rivet (safety pin)6. Handle<ul style="list-style-type: none">a) Woodb) Fiberglass1) No wedgesB. Use<ul style="list-style-type: none">1. Cutting trees and brush, grubbing and trenching2. Grip and stance, similar to brush hook <p>NOTE: Demonstrate</p> <ul style="list-style-type: none">3. Swing - cutting edge and grubbing edge<ul style="list-style-type: none">a) Safety considerations - same as brush hookb) Cutting anglec) Removing chips when chopping heavier stems and limbs <p>C. Sharpening</p> <p>NOTE: Refer students to page 4</p> <ul style="list-style-type: none">1. Taper on cutting edge - 1½ to 2 inches	<p>Draw a stem on board and show a "V" pattern and how chips are removed</p> <p>Display graphic 4205.3-1, page 4</p>



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NOTE: Refer students to page 5

Display graphic
4205.3-1, page 5

NOTE: Discuss necessity of removing equal amounts of material from corners of blade to maintain shape of cutting edge

2. Taper on grubbing edge - 45 degrees

IV. AXES

A. Types

1. Double bit
2. Single bit

B. Parts and nomenclature

NOTE: Refer students to page 6

Display graphic
4205.3-1, page 6

1. Handle, wooden or fiberglass
 - a) Shoulder
 - b) Butt
2. Head, metal
 - a) Cutting edge
 - b) Eye
 - c) Flat head
3. Wedges
 - a) Wood



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<ul style="list-style-type: none">b) Steelc) Polystyrene (plastic) <p>C. Basic use</p> <ul style="list-style-type: none">1. Vegetation fires<ul style="list-style-type: none">a) Cutting brush and small trees <p>D. Safety precautions</p> <ul style="list-style-type: none">1. When using<ul style="list-style-type: none">a) Maintain 10 foot intervalb) Maintain firm footingc) Watch for obstructions<ul style="list-style-type: none">1) Overhead2) Within arc of swingd) Wear gloves and full safety uniform<ul style="list-style-type: none">1) Pay particular attention when gloves are wete) Do not allow head of tool to get too near bodyf) Concentrate on impact area to:<ul style="list-style-type: none">1) Prevent ricochet or glancing blow2) Avoid rocks and other hard objects3) Avoid hazards<ul style="list-style-type: none">• Beehives• Electrical wires	



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- Barbed wire
- g) Pace yourself
- h) Use proper tool for the job
- 2. When carrying
 - a) Grasp at balance point with head forward
 - b) Carry on downhill side
 - c) Carry horizontally (parallel) to the ground
 - 1) Double bits carry blunt sharpened edge up
 - d) Sound off when passing another person with "coming through" and wait for that person to yield right of way
- 3. When passing
 - a) Pass handle (butt) first
 - b) At arms length from other person
 - 1) Never toss
- 4. When grounding tool
 - a) Place head of tool toward center of circle with handle outward if a group of tools or cover with shovel if single tool
 - b) Shield the head of the tool to the extent possible
 - 1) Use tool guards whenever practicable
 - c) Place all crew tools in the same area
- E. Sharpening



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NOTE: Refer students to page 7

Display graphic
4205.3-1 page 7

1. Cutting edges properly sharpened
 - a) Use flat mill bastard file
 - b) Apply even pressure across full width of the cutting edge
 - c) Sharpened from cutting edge back in an arc
 - d) Double bit axe
 - 1) One edge sharpen back 2"
 - 2) One edge sharpen back 1"
 - Free of nicks or chips
 - Permissible to treat with a rust inhibitor
 - Tool guard in place whenever tool is not in use

V. SAFETY:

- A. Always wear gloves when handling hand tools
- B. Inspect tool prior to using
 1. Tool head
 - a) Cracks
 - b) Rust
 - c) Dull cutting edges
 - d) Loose handle



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<ul style="list-style-type: none">1) Wedges2) Rivet (safety pin) <p>2. Handle</p> <ul style="list-style-type: none">a) Roughb) Warpedc) Cracks or breaks <p>C. Carrying procedure</p> <p>NOTE: Refer students to page 8</p> <p>NOTE: Demonstrate</p> <ul style="list-style-type: none">1. At your side2. Horizontal3. Head forward4. At tool's balance point5. Cutting edge down6. Downhill side7. Do not run with tool8. Work and walk ten feet apart <p>D. Working procedures</p> <ul style="list-style-type: none">1. To pick up, grasp tool<ul style="list-style-type: none">a) At balance pointb) Thumb down	<p>Display graphic 4205.3-1 page 8</p>



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<ul style="list-style-type: none">c) With tool head toward front of body2. Maintain ten foot spacing<ul style="list-style-type: none">a) Announce “Coming Through”, when approaching within 10’ of a working tool3. Maintain a firm grip on the tool4. Maintain firm solid footing5. Maintain balanced stance6. Maintain a clear swing path<ul style="list-style-type: none">a) Check over head and behindb) Check location of other workersc) Make dry run swing first7. Keep your eye on point of impact<ul style="list-style-type: none">a) Tool will follow your eye8. When not in use, cutting tools are placed flat on the ground<ul style="list-style-type: none">a) Out of main pathway or any other place where they may injure someoneb) “Wagon wheel” formation	<p>Diagram on chalkboard or use a visual aid</p>
VI. CARE AND MAINTENANCE OF CUTTING TOOLS: <ul style="list-style-type: none">A. Sharpening<ul style="list-style-type: none">1. Always wear gloves2. Use flat mill bastard file	



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<ul style="list-style-type: none">3. Always file away from cutting edge4. Use forward file strokes only<ul style="list-style-type: none">a) Do not slap the file down on the cutting edge5. Always use with a file guard and handle6. Do not wrap fingers around forward end of file<ul style="list-style-type: none">a) Use the heel of your open hand on the forward end of the file7. Sharpen to proper taper8. Check sharpness visually<ul style="list-style-type: none">a) Do not run a finger or thumb over edge to check sharpnessB. Care and Maintenance of Handles<ul style="list-style-type: none">1. Use sandpaper to remove splinters and rough spots2. Follow camp policy regarding replacement of cracked or broken handles<ul style="list-style-type: none">a) Alert the Fire Captain to the problemC. Transporting cutting tools<ul style="list-style-type: none">1. In Crew Carrying Vehicle (CCV)<ul style="list-style-type: none">a) In proper rack in tool compartmentb) Secured2. In helicopter<ul style="list-style-type: none">a) Follow instructions of the Fire Captain or the Helitack Crew member	



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Have students identify the parts of each cutting tool

Have students explain proper safety procedures for cutting tools

While using

While maintaining

Administer Topic Quiz



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SUMMARY:

When chainsaws go out of service, line cutting must still take place. The student must be familiar with brush hooks, pulaskis, and axes, as well as the correct way to use and maintain these tools.

EVALUATION:

The student will complete a written quiz at a time determined by the instructor.

ASSIGNMENT:

Review your notes and Student Information Sheet(s) in preparation for the upcoming quiz. Study for the next session.